

small in amplitude and had an average period of 6.4 seconds. At 1h. 35m. 7s. they were followed by the second series of preliminary tremors, much larger in amplitude and with an average period of 11.4 seconds. These tremors, as is now well known, traverse the body of the earth with velocities of about 10 or 11 and 5 km. per second respectively. At 1h. 45m. 13s. began the principal portion of the movement, consisting of undulations which travel over the surface with a nearly uniform velocity of 3.3 or 3.4 km. per second. In the initial phase of this portion the undulations had an average period of 44.1 seconds; in the slow-period phase (which began at 1h. 50m. 22s.) of 25.2 seconds, and in the succeeding quick-period phase of 16.2 seconds. Unfortunately, this portion of the record is incomplete, for the pointer of the pendulum swept off and on the drum three times, several waves being thus lost, and the initial epoch of the quick-period phase cannot be determined. The end-portion of the disturbance began at 2h. 1m. 4s., and consisted of a long series of unusually clear and regular waves with an average period of 15.0 seconds. The duration of this portion is uncertain, for these waves were reinforced at 3h. 28m. 38s. by the undulations of the principal portion which travelled through the antipodes along the major arc joining San Francisco and Birmingham. At 3h. 56m. 57s., however, the trace becomes nearly steady, but a careful examination reveals another series of long, low undulations from 4h. 58m. 32s. to 5h. 6m. 34s., which represent the return of the first series of surface-undulations after they had completed the tour of the globe and travelled once more as far as Birmingham. The interval between the first and third passages of these waves is 3h. 13m. 19s., and corresponds to a mean velocity of 3.36 km. per second.

MAGNITUDE OF THE SAN FRANCISCO EARTHQUAKE.

The mere fact that the earth-waves should disturb a seismograph after travelling 30,000 miles is sufficient evidence to show that the earthquake belongs to the very front rank. If we might estimate the intensity of a shock by the maximum range of movement at Birmingham, we should have to regard the San Francisco earthquake as much stronger than the Indian earthquake of April 4, 1905, but as inferior to the remarkable Central Asian earthquakes of July 9 and 23, 1905. The period of the larger waves approaches, however, so closely to that of the pendulums themselves that it by no means follows that the range and epoch of the maximum displacement of the instruments correspond with those of the earth's crust. Nor can we infer much from the extent of the destruction of the lofty, badly-founded houses of San Francisco. If the Colchester earthquake of 1884 had originated beneath the city and west-end of London instead of beneath the villages of Peldon and Rowhedge in Essex, the damage would have been considerable, and the earthquake would have held a higher place in our estimation. When, however, we consider the great area covered by the injured towns in California, the displacement of the superficial soil, the crumpling of the railway tracks, and the widespread registration of the unfelt waves, it is clear that we must give to the San Francisco earthquake a place inferior, no doubt, to the Lisbon earthquake of 1755 and the Indian earthquake of 1897, but probably one in the same rank as the Neapolitan earthquake of 1857, the Japanese earthquake of 1891, and the Indian earthquake of 1905.

C. DAVISON.

THE LIFE OF THE AUSTRALIAN BLACKS.¹

BOTH for the anthropologist, who wants well-sifted and trustworthy material, and for the ordinary reader who would like to know something about the life of the native Australian, this is a most useful book. In fact, for the latter purpose it may be said to stand entirely alone. There is no other work on the Australians which gives anything like so good a general view; it is clear of superfluous technicalities, eminently readable, and written with so much sympathy that we cease to be surprised at the success of the writer in getting at such secret matters as male initiation ceremonies and beliefs about Byamee, all of which are strictly forbidden lore to the Euahlayi woman. Mr. Lang's introduction explains the bearing of the book on current controversies.

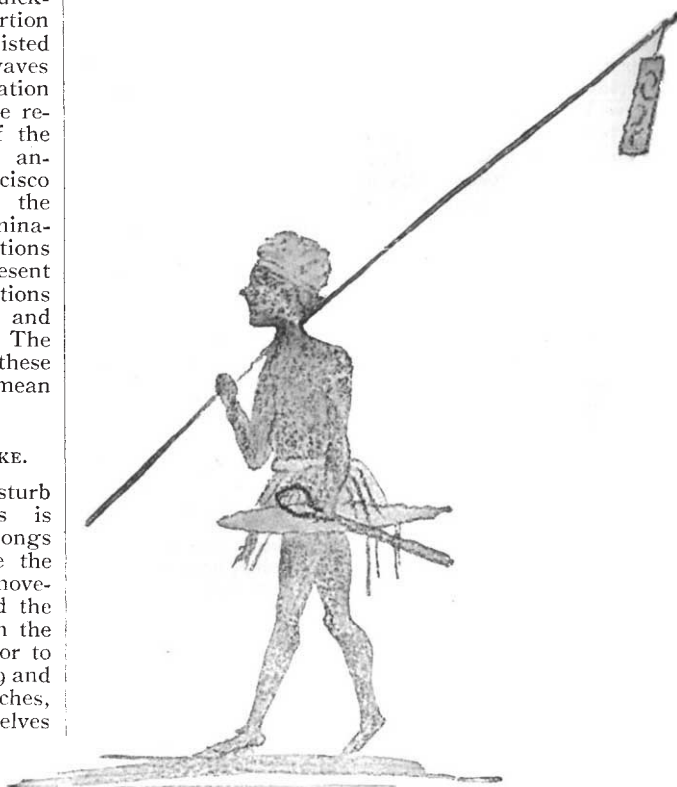


FIG. 1.—A native carrying a message-stick. From "The Euahlayi Tribe."

Besides these two important subjects, Mrs. Parker has much to tell us about the social organisation, magicians and their initiation, a witch woman whose feats are distinctly mystifying, the life of children of both sexes up to and including the initiation ceremonies, burial customs, dress, amusements, the provision of food, and mythology; and on many points we learn something which throws light on previous knowledge. Although we hear nothing of the so-called sex-totem among the Euahlayi, they hold that the male children are made by a lizard, the female by the moon, who is sometimes assisted by the crow. This looks like the raw material of the sex-totem. It

¹ "The Euahlayi Tribe, a Study of Aboriginal Life in Australia." By K. Langloh Parker; with an Introduction by Andrew Lang. Pp. xxvii+156; with 6 illustrations by a native artist. (London: A. Constable and Co., Ltd., 1905.) Price 7s. 6d. net.

may be noted that the lizard is one of the forms of the sex-totem in South Australia. In connection with children, it is interesting to note that we have in the Euahlayi a variant of the Arunta belief recorded by Strehlow, which has also a close connection with the belief of the northern Arunta visited by Spencer and Gillen.

An important subject, on which little information was previously available, is that of the *yunbeai* or individual totem, which is usually confined to medicine men, but among the Euahlayi is held to be granted to their special favourites. More important still is the information about Byamee. Unless Mrs. Parker's evidence can be impeached on the ground of European influence, it will henceforth be impossible to deny that the Australians have gods and a religion. We learn from this work that prayers are offered to Byamee both at the Bora and at the funerals of men.

Mrs. Parker alludes to the boomerang, and provides mathematicians with another problem in the shape of the performances of the *boodthul*, a miniature club which travels further if it is thrown through the top of a bush than if it has an unimpeded flight. The book contains six illustrations by a native artist. Mrs. Parker does not mention them, but she has informed the present writer that the artist had no European training. It may, however, be surmised that he had seen European pictures. N. W. T.

BORIC ACID AS A FOOD PRESERVATIVE.

THE report of the English departmental committee on the use of preservatives in foods contains voluminous evidence on the harmful nature of most of the antiseptics employed in commerce. It was issued in 1901, and among its recommendations one finds that the use of any preservative in milk should be constituted a punishable offence. It, however, makes an exception in the case of butter and cream, which are substances taken in relatively small amounts, and allowed 0.5 per cent. of boric acid in the former, and 0.25 per cent. in the latter case.

Those who have had the time to read the evidence will be struck with the almost complete unanimity of the medical witnesses on the harmful effects produced by boric acid and its compounds. Unfortunately there will always be some who disagree with the majority, and it is particularly unfortunate from the point of view of the public welfare that one of these is Dr. Oscar Liebreich, whose opinion is on most subjects entitled to careful consideration and respect. The special pleading on behalf of boric acid and borax contained in Dr. Liebreich's former publications are repeated in the pamphlet just issued, and we fear that the useful work of those who are trying to prevent adulteration, and protect the public from those tradesmen who cover their misdeeds and want of cleanliness by the employment of antiseptics dangerous to health, will be seriously impeded thereby.

The question has also become an acute one in America, and the United States Department of Agriculture appointed Dr. Wiley, their principal chemist, to investigate the matter on a large scale by experiments on human beings, over a long period. Dr. Wiley's report was most unfavourable to the use of these preservatives; the ill-health set up in the subjects of his experiments, and the alterations in bodily metabolism to which this was due, are described in detail, and furnish systematic evidence on the subject which confirms what was known from clinical experience, and to those who had experimented previously

on animals. To the unprejudiced observer Dr. Wiley's report settled the matter once and for all.

The special object of Dr. Liebreich's new brochure is to criticise some details in Dr. Wiley's work. This is always an easy thing to do when the subjects of an experiment are numerous, and in the human subject in particular it is often difficult to obtain precise details. Some of these, on account of the ill-health set up by the drug, had to abandon the continuation of the observations. This obviously reduces the number of observations, but at the same time is in itself a striking piece of evidence against the continued use of borax and boric acid. Dr. Liebreich does not dispute the ill-health of Dr. Wiley's willing subjects, but he is driven to attribute this to other causes, like inefficient hygienic surroundings. He does not dispute the loss of body weight, but says this is not by any means always injurious.

Those interested in this most important question should of course read both sides, and one sincerely trusts that in this instance the weight of a great name will not be allowed to overbalance the all but universal testimony of others to the contrary.

PROF. W. F. R. WELDON, F.R.S.

THE 'seventies of last century may be said to have witnessed the renaissance of biological studies in Cambridge. It was in the year 1870, if we mistake not, that Michael Foster, at the invitation of Trinity College, became prælector in physiology and founded the great school for which the university has since been famous. Of his pupils the greatest was F. M. Balfour. He very soon became the centre of a new system which was thrown off, so to speak, from the main body, and rapidly acquired form and influence.

Weldon was one of the most distinguished products of the zoological school which was in this way established. He was the son of Mr. Walter Weldon, F.R.S., the distinguished chemist, and was educated at King's College, London. He entered at St. John's College, Cambridge, in 1878, of which foundation he became first a scholar and in 1884 a fellow. After taking his degree in 1881 he at once threw himself with characteristic vigour and disinterestedness into zoological teaching and research. He became demonstrator in comparative anatomy in 1884, and held the office for one year. In 1885 he was appointed to the newly-established lectureship on the morphology of the invertebrata, which office he held until he left Cambridge in 1891. As a lecturer Weldon is not likely to be forgotten by those who heard him. He was remarkable for the ease and mastery with which he handled his subject, and for the earnestness and clearness of his teaching. It was impossible to sit inert under him; he had the gift of compelling attention.

Weldon's early researches were mainly concerned with morphological problems, the study of which had been so strongly stimulated by the work of Darwin. In the 'sixties, 'seventies and early 'eighties of last century the hope existed that it would be possible by minute morphological study actually to trace the pedigrees of existing organisms and to get some comprehension of the wonders and complexities of animal structure. In the 'eighties, however, with the progress of experience it began to be obvious that these hopes could not be realised, that the problem could not be solved by morphology, and that we must turn to other sources if we wanted to progress in ideas. Weldon was soon touched by the scepticism which thus arose, and cast about in the latter part of his time at Cambridge for new methods. These he saw must come in part at least from an exact study of variation, and

¹ "Third Treatise on the Effects of Borax and Boric Acid on the Human System." By Dr. Oscar Liebreich. Pp. vii+70. (London: J. and A. Churchill, 1906.) Price 5s. net.